CLAIMS

1. A method of carrying out signal-processing consideration of a measurement signal related to the respiration activity of a person, in particular for matching pressure regulation in the administration of a breathable gas at a pressure level which at least in phase-wise manner is above the ambient pressure, characterised in that in the context of signal-processing consideration of the measurement signal indicative of the respiratory gas flow evaluation results are generated, which permit differentiation between obstructive and central breathing disorders.

2. A method as set forth in claim 1 characterised in that in this case the inspiration time and the expiration time is detected for successive breaths.

3. A method as set forth in claim 1 or claim 2 characterised in that the ratio of inspiration time and expiration time is detected.

4. A method as set forth in claim 3 characterised in that an evaluation signal which gives information as to whether imminent or already existing breathing disorders are obstructively and/or centrally caused is generated by consideration of the change in respect of time of said ratios.

5. A method as set forth in at least one of claims 1 through 4 characterised in that evaluation results which give information as to whether a breathing disorder phase is imminent are generated from comparative evaluation of successively occurring changes in properties of the derivatives, in particular the first derivative of the respiratory gas flow in the region of the breathing phase change.

6. A method as set forth in at least one of claims 1 through 5 characterised in that the ratio of inspiration time Ix to expiration time Ex is used to describe breathing disorders.

7. A method as set forth in at least one of claims 1 through 6 characterised in that a change in the duration of the inspiration time with respect to the expiration time represents a pointer to imminent obstruction in the upper respiratory tracts.

8. A method as set forth in at least one of claims 1 through 7 characterised in that evaluation results for an existing or imminent disturbance phase are extracted from comparative consideration of successively occurring changes in properties of the derivatives of the - or within the - respiratory cycles, in particular the first derivative of the respiratory gas flow in the region of the breathing phase change.

9. A method as set forth in at least one of claims 1 through 8 characterised in that consideration of the differential is directed to the beginning of the inspiration cycle and/or to the end of the inspiration cycle.

10. A method as set forth in at least one of claims 1 through 9 characterised in that consideration is directed to the curve shape during the inspiration cycle.

11. A method as set forth in at least one of claims 1 through 10 characterised in that the average gradient is calculated in simple form for intervals which extend for example over 10% of the time duration of the respective breathing phase.

12. A method as set forth in at least one of claims 1 through 11 characterised in that the gradient of the v°-configuration is calculated floatingly within a window over the inspiration cycle.

13. A method as set forth in at least one of claims 1 through 12 characterised in that the trend analysis is effected in particular in respect of the nature and constitution of the breathing drive.

14. A method as set forth in at least one of claims 1 through 13 characterised in that the trend analysis is preferably effected having regard to/with the inclusion of the signal evaluation results specified hereinafter:

max. peak flow during the inspiration cycle

the breath volume

the inspiration time

the second derivative of the measured flow curve.

15. A method as set forth in at least one of claims 1 through 14 characterised in that signal-processing consideration is effected on the basis of consideration of the differential at the beginning of the expiration cycle or at the end of the expiration cycle respectively.

16. A method as set forth in at least one of claims 1 through 15 characterised in that the differential is calculated in a simple form over an interval of for example 10% at the beginning of the expiration cycle and after the expiratory maximum flow or calculated floatingly over the expiration cycle.

17. A method as set forth in at least one of claims 1 through 16 characterised in that the evaluation procedure is carried out with the inclusion of the maximum peak flow during the expiration cycle, the breath volume and/or the expiration time and/or the second derivative (curvature) of the measured flow curve during the expiration cycle.

18. A method as set forth in at least one of claims 1 through 17 characterised in that on the basis of the evaluation procedure there is generated an evaluation result which furnishes information about the nature and the constitution of the upper respiratory tracts.

19. A method as set forth in at least one of claims 1 through 18 characterised in that consideration of the configuration of the curve shape includes analysis of the number of local maxima and minima, the amplitude of the local maxima and minima, the sequence of the magnitude of the amplitudes of local maxima and minima and the frequency in the sequence of local maxima and minima.

20. A method as set forth in at least one of claims 1 through 19 characterised in that signal processing also includes spectral consideration and consideration in respect of amplitude of a snoring signal.

21. A method as set forth in at least one of claims 1 through 20 characterised in that signal-processing evaluation and the trend analysis based thereon are effected on the basis of combined consideration of at least two parameters specified hereinafter.

22. A method as set forth in at least one of claims 1 through 21 characterised in that trend analysis is based on consideration of the variation in the ratios between two of the parameters specified hereinafter: inspiration time, expiration time, breath duration, breath frequency, breath volume during the inspiration cycle, breath volume during the expiration cycle, first differential and second differential of the respiratory flow, amplitudes of local maxima and local minima, frequency of local maxima and local minima, inflexion points, maximum inspiratory flow and maximum expiratory flow.

23. A method as set forth in at least one of claims 1 through 22 characterised in that on the basis of the evaluation procedure there are generated evaluation results which give information about:

- the nature of the upper respiratory tracts inter alia for differentiating between central and obstructive apneas

- the elastic properties of the upper respiratory tracts (restoring modulus, modulus of elasticity)

- the location of an obstruction

- the degree of severity of a sleep apnea, and

- the Pcrit-value.

24. Apparatus for carrying out the method as set forth in at least one of claims 1 through 23.

25. Apparatus for supplying a respiratory gas to a patient at a pressure level which is above the ambient pressure at least in phase-wise manner, comprising a delivery device for delivering the respiratory gas, a measuring device for generating a signal indicative in respect of the respiratory gas flow, a regulating device for regulating the respiratory gas pressure to a predetermined reference pressure, and a pressure presetting device for presetting the reference pressure, characterised by a signal processing device which is configured in such a way that on the basis of a variation in respiratory cycle-specific reference features, it generates an evaluation result which is indicative of whether or to what extent a prevailing or imminent breathing disorder is of obstructive or central origin and that the reference pressure is determined having regard to said evaluation result.

26. Apparatus as set forth in claim 25 characterised in that it includes a respiratory gas line extending between the delivery device and a breathing mask, and a breathing mask device.

27. An evaluation apparatus for evaluation of a series of measurement data which contains items of information indicative in respect of the pattern in respect of time of the breathing of a patient, including a signal processing device which is configured in such a way that on the basis of a variation in respiratory cycle-specific reference features, it generates evaluation results which are indicative of whether or to what extent the

measurement series contains sequences which are to be classified as a breathing disorder of obstructive or central origin.

28. An evaluation apparatus as set forth in claim 27 characterised in that the measurement series can be visualised at least in portion-wise manner and that the sequences of presumed disturbed breathing can be emphasised distinguishably as sequences of obstructive or central origin.